MANUFACTURING APP PLATFORM (TULIP) & INDUSTRIAL IOT

AGILE WORKSTATION DIGITIZATION

MANUFACTURING APP PLATFORM TULIP & INDUSTRIAL IOT,

AGILE SOLUTIONS FOR: VISUAL
WORK INSTRUCTIONS ACCELERATED
TRAINING PROCESSES
0-PAPER AUDITS & CONTROLS WITH CONNECTED TOOLS
MACHINE MONITORING & MAINTENANCE EASY
MONITORING OF PRODUCTION INDICATORS
DEPLOYMENT OF LEAN MANUFACTURING PRINCIPLES

www.smarterprod.com

Smarter Prod is a brand of ERM Automatismes

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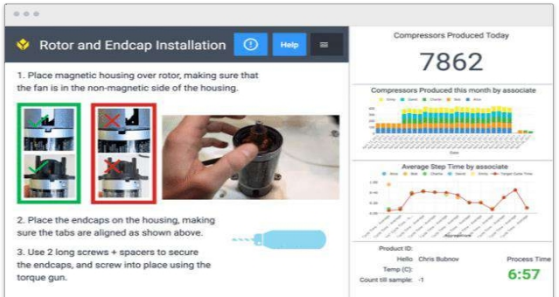
Didactique | Robotique | Fab&Test | Energies



"A TEAM OF ENGINEERS TO SUPPORT YOU IN INDUSTRY 4.0"

SINCE 1990

S

INTEGRATION INTO YOUR IS

TRAINING & SUPPORT

P

RE-PROJECT

PROOF OF CONCEPT (POC)

INTEGRATION INTO YOUR WORKSTATION

TULIP

SICK

Sensor Intelligence.

What "Smart Industries" solutions can do for you

From reality

- Critical manufacturing processes controlled with analog tools and reported in Word/Excel
- Limited or no visibility of processes
- Machine data not collected and not used optimization
- No/few operator guidance and feedback
- Data silos process optimization
- Legacy software

TULIP

SICK
Sensor Intelligence.

SMARTER PROD

To the promise Industry 4.0

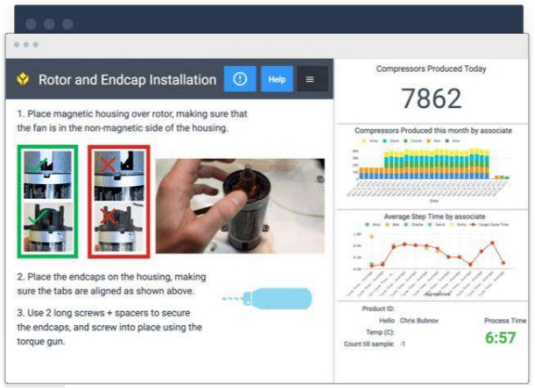
- → Intelligent, connected machines and workstations
- → Visibility and control all machines and workstations
- → Plant digitization boosts technician productivity
- → Technicians' contribution to continuous improvement
- → Data interoperability and data-driven decision-making
- → "Intelligence in the Cloud" as a solution to all production and maintenance problems

Digitalize workstations

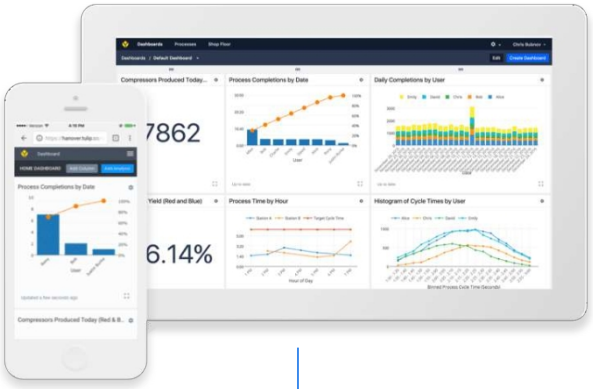
Tulip is used to improve and optimize workstations with technicians.

PROCESS FACTORY

CLOUD MANUFACTURING APP



PRODUCTION DATA IN REAL TIME



PROCESS OPTIMIZATION

Tulip deploys easily and generates rapid ROI

TOOL FOR CREATING MANUFACTURING APP

IOT DEPLOYMENT ON WORKSTATIONS

DASHBOARDS ANALYTICS (BIG DATA)

SELF-SERVICE

Create and modify applications in-house without a single line of code

PLUG AND PLAY IOT

Easy connection of all machines and tools

VISION ON KEY-DATA

Measure and monitor key data through visual analysis

Tulip can be used a wide range of workshop/plant applications

VISUAL WORK INSTRUCTIONS

Guide operators using visual procedures instead of paper-based ones

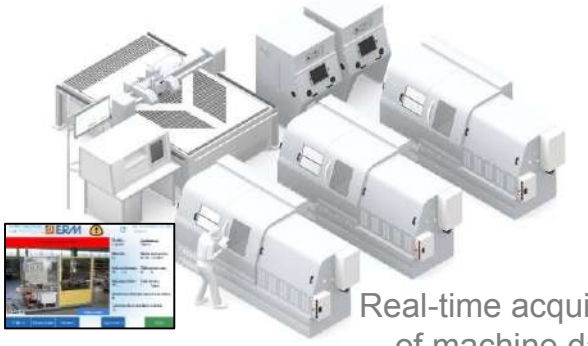
TRAINING

Simplify and continually improve training procedures

AUDIT & QUALITY

Replace paper forms with applications using IoT tools (cameras, scales, etc.)

MONITORING AND MAINTENANCE OF MACHINES

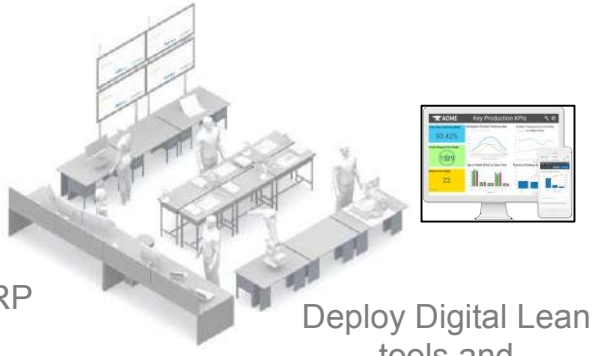


Real-time acquisition of machine data during production

TASK TRACKING AND VISIBILITY

Import OFs from an ERP (Odoo, ...), program production indicators (TRS, MTBF, Productivity rate, ...) and display them on dashboards.

DIGITAL LEAN



Deploy Digital Lean tools and dashboards

Example: Jabil| 0-paper work instructions

GENERAL

- Income: $20B
- Employees: 200,000
- HQ: St. Petersburg, FL
- Industry: CM
- Plants: 90+

CHALLENGE

- Low-volume, high-diversity production plant with "paper" work instructions
- Quality process on "paper" forms
- No visibility on process times

APPS

- VISUAL WORK INSTRUCTIONS
- AUDIT &
- QUALITY
- TRAINING

SOLUTION

- Operators are guided by visual work instructions (Tulip application) on touch screens
- Production data is consolidated and visualized on a dashboard providing visibility on production indicators (KPIs).
- Process audits (5S...) are carried out on Tulip applications.

CONNECTED TOOLS

- BARCODE SCANNER
- CAMERA
- TABLETS

RESULTS

defects

60% ↓
Quality

↑ 10%
Production yield

4 Weeks
Return on investment

"Now we have a real-time vision that allows us to optimize even small production runs" - Quality Engineer

SOFTWARE CONNECTED TO _____

No

Industrialists, choose the right plan for your organization

Standard:
95 per station per month

Build powerful production applications.

Ideal for guiding operators through manual processes and collecting production data

- ✓ Unlimited applications
- ✓ No user limit
- ✓ Unlimited data analysis
- ✓ Connecting USB tools/sensors
- ✓ SQL and REST connectors

Professional:
195 per station per month

Build robust applications with IoT tools and sensors.

Ideal for combining manual workflows with data from sensors and IoT tools.

- ✓ Standard" features
- ✓ Industrial protocol support
- ✓ GPIO IoT connectivity
- ✓ Business Intelligence integration
- ✓ Machine monitoring module
- ✓ Additional "Dashboard stations

Company:
Let's talk

Build applications for large-scale deployment.

Ideal for multi-site deployments requiring integration with existing systems
registration and control.

- ✓ Professional" features
- ✓ Advanced data governance
- ✓ Advanced security
- ✓ Advanced user management
- ✓ ERP and MES integration
- ✓ Local deployment option "On-premise
- ✓ GxP qualification (Medical & Pharmaceutical)

TULIP

Special offers for training centers→ Please contact us

Factory Kit: Everything you need to start digitizing your plant

- 12-month subscription to the Tulip SaaS platform
- Tulip Footbridge I/O Gateway
- Tulip Light Kit
- IIoT tools (code scanner bars, Pedal, Andon beacon, Temperature and humidity sensors, Beam break sensor)
- Examples application
- Training & Support

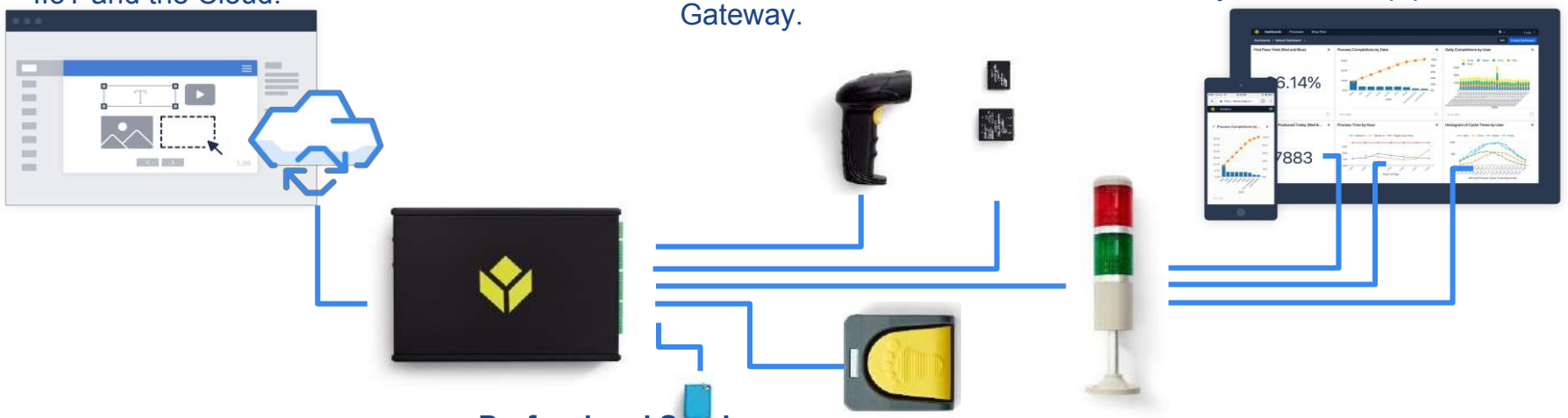
Start for only:

3500€ EXCL. TAX

1 **App Builder.** Build your production applications with the power IIoT and the Cloud.

2 **Process IoT.** Connect your sensors and tools with Tulip's I/O Gateway.

3 **Analytical data.** Collect key data operators, tools and machines of your workshop/plant.

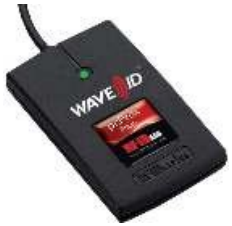


4 **Professional Services.** Training, station deployment, interfacing with your ERP and expertise to help you build the most relevant use cases.

Tulip and Sick solutions make it easy to add and connect sensors and tools to machines and equipment.
workstations to improve productivity and maintenance

Andon beacons

Barcode scanners



RFID transceivers

Cameras

Scales and load cells

Pedals

Buttons

TULIP

SICK
Sensor Intelligence.

SMARTER PROD

Safety sensors and protection (Laser scanners...)

Sensors for distance, position, proximity...

Pick-to-Light

Connected screwdrivers

Current sensors

Connect your machines and workstations

(vibration, acceleration, etc.)

(level, flow, pressure, temperatu re, etc.)

For more information: **www.smarterprod.com**

Dimensional measurements

TULIP for vocational training in Production Management & Maintenance

Tulip's main functions

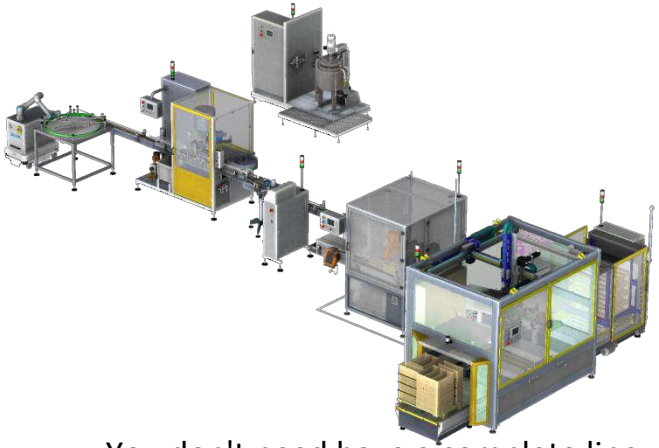
- Creation of digital work procedures
- Machine PLC data
- Communication with an ERP (Enterprise Resource Planning) system
- Calculation and display of performance indicators (TRS, MTBF, etc.)
- Digitization quality forms
- Digitization audit forms

Highlights

- Disposal of all paper documents
- Very easy to use
- Quick and easy application programming
- Mathematical calculations can be performed determine production indicators
- Visualization of all production-related data on a tablet or computer
- Operator self-training through procedures visual workstations
- Flexibility to modify applications and add steps as needed
- Dashboard customization: by machine or by production line or product,...
- Communication with remote machines via the Kepware communication server.
- Possibility of using devices connected to the workstations (scales, , camera, etc.)

Didactic production lines already available with Tulip

ERMAFLEX line



ERMASM ART line

You don't need have a complete line - you can use TULIP on a single workstation.

TULIP for vocational training in Production Management & Maintenance

Tulip references for professional training

UC50 : Tulip "MES", Digitalization of procedures, Machine monitoring, Communication with ERP, Key production indicators

- Application for digitizing work procedures, creating and monitoring production indicators in real time
- Application for monitoring data from machine PLCs during production (a "light" supervision application)
- Creation and follow-up of orders.
- Real-time calculation of production indicators such as TRS, MTBF, etc.
- Creation of dashboards to monitor production rates and display key production indicators for the production manager.
- A PC with a Kepware communication server (with 1-year maintenance contract)
- Tulip Pro software (3-year license included)
- A one-and-a-half-day training course on site or remotely

UC51: Digitization of procedures, key performance indicators production

- Application for digitizing work procedures
- Creation and monitoring of real-time production indicators in using data from machine controllers
- Application for creating production orders
- A Windows go touchscreen tablet
- Kepware demo version limited to 2h continuous use. PC for Kepware server hosting not included
- Tulip Pro software (3-year license included)
- One-day on-site or remote training

UC52: Digitizing procedures

- Application for digitizing work procedures
- Application for creating production orders
- Production monitoring based on forms created in Tulip (machine stoppages, non-conforming parts)
- A Windows go touchscreen tablet
- Tulip Standard software (3-year license included)
- Half-day training on site or remotely

UC53: Tulip IoT Connected Assembly, Quality Control and Sampling

- Aluminium profile frame on castors with ergonomic workstation
- Touch screen with integrated PC
- Tulip I/O Gateway
- Tulip Light Kit (For Pick-to-Light)
- IIoT tools (barcode scanner, foot pedal, Andon beacon, temperature and humidity sensors, beam break sensor)
- USB electronic scale
- USB electronic caliper

- Tulip Pro software (3-year license included)
- Tulip quality control application model

Example 1: CFAI Bruz, Agro line| Product traceability

GENERAL

- First network private of technical and industrial training
- Employees: 700
- 33 Bac pro, BTS, DUT, licence and engineer diplomas

CHALLENGE

Operate a food production line in "Enterprise" configuration, with:

- production orders
- traceability of trays produced
- visibility on production indicators

SOLUTION

- You can select OFs that have already been created at
  using Odoo ERP.
- Communication between Tulip and Odoo ERP for product traceability
- Operators are guided by visual work procedures (Tulip application) on touch-screen tablets.
- Production data for each machine is consolidated and visualized, providing visibility on production indicators (OEE, MTBF, etc.).
- Creation of dashboards based analyses to facilitate understanding of production events

Video of the robotized production line

APPS

- INSTRUCTIONS VISUAL WORK
- MACHINE MONITORING
- JOB TRACKING AND VISIBILITY

CONNECTED TOOLS

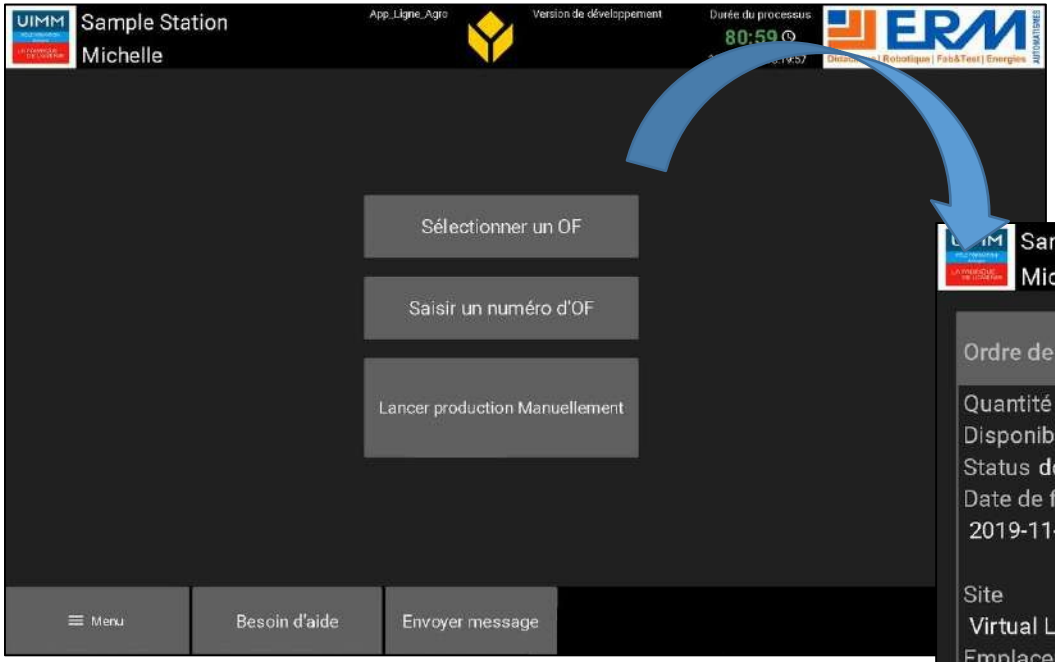
- COMPUTERS
- SCANNER OF CODES-BARRES
- TABLETS

SOFTWARE CONNECTED TO

- SERVER OPC - KEPWARE
- ERP - ODOO

Example 1: CFAI Bruz, Agro Line| Product traceability and OF launch

Main step importing an OF from ERP

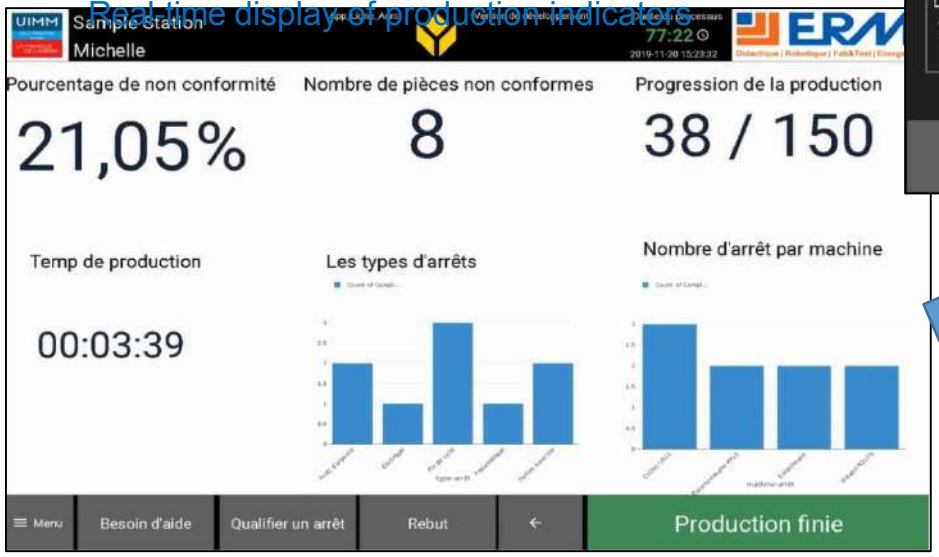


odoo

ERP + CRM

Production order details

Real-time display of production indicators



SERVEUR OPC

kepware®

Example 2: CFAI Bruz, Ligne Méca| Digital work instructions

GENERAL

- First network private of technical and industrial training
- Employees: 700
- 33 Bac pro, BTS, DUT, licence and engineer diplomas

CHALLENGE

Use a didactic key ring production line consisting of several unconnected machines:

- Production information
- Visibility on production indicators

APPS

VISUAL WORK INSTRUCTIONS

TRAINING

JOB TRACKING AND VISIBILITY

SOLUTION

- Production information can be entered manually for each machine using a tablet.
- Use of specific forms to facilitate production tracking and eliminate paper use
- Operators are guided step-by-step through machine set-up using digital work instructions.
- Production for each machine are easily entered by operators, enabling the calculation of various production indicators (OEE, MTBF, etc.).

CONNECTED TOOLS

COMPUTERS

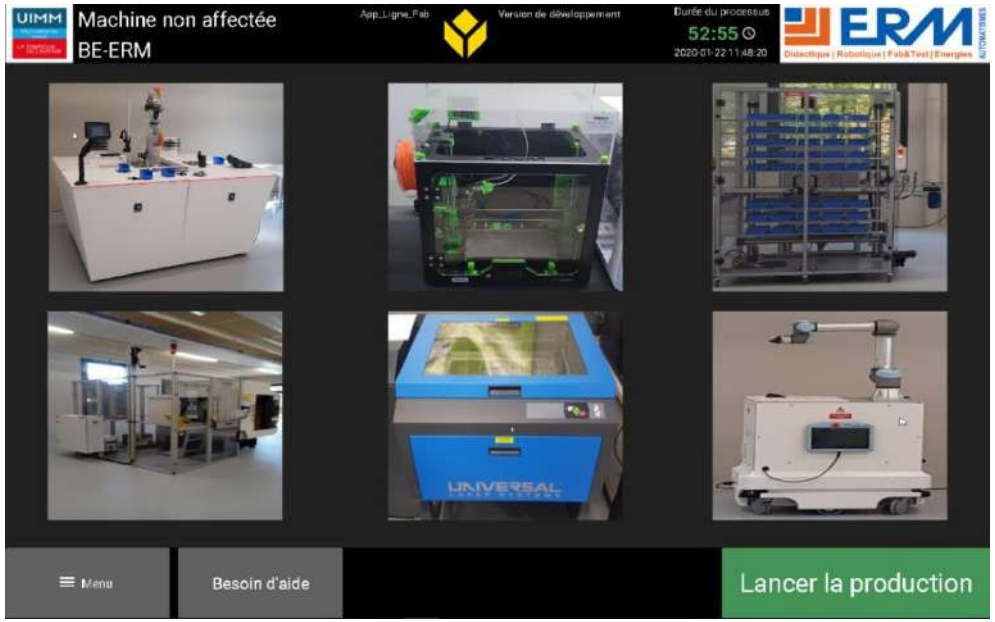
TABLETS

SOFTWARE CONNECTED TO

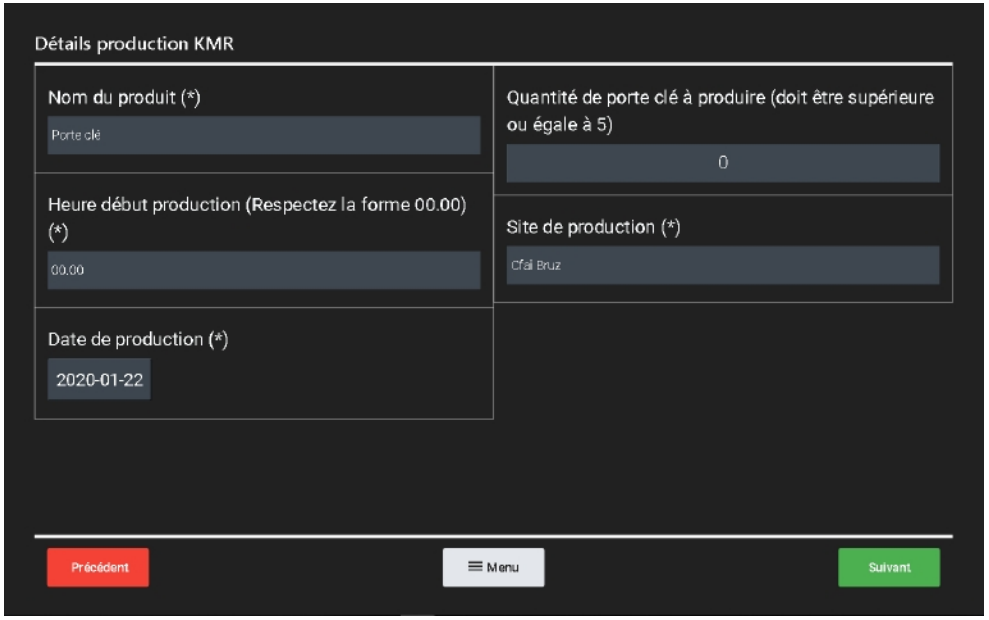
No

Example 2: CFAI Bruz, Ligne Méca| Digitizing tasks using forms

Production machine selection stage

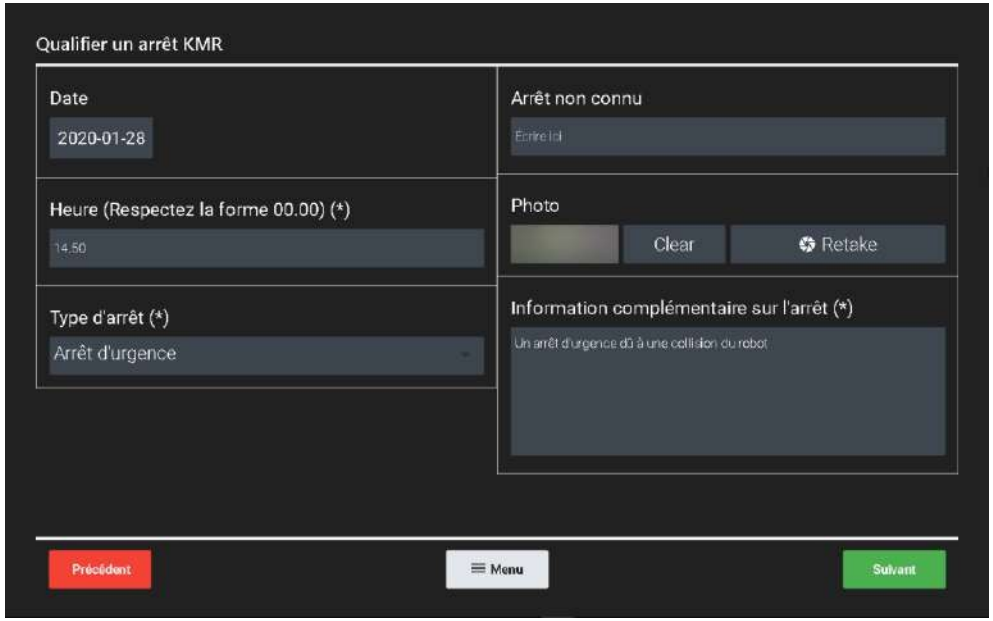


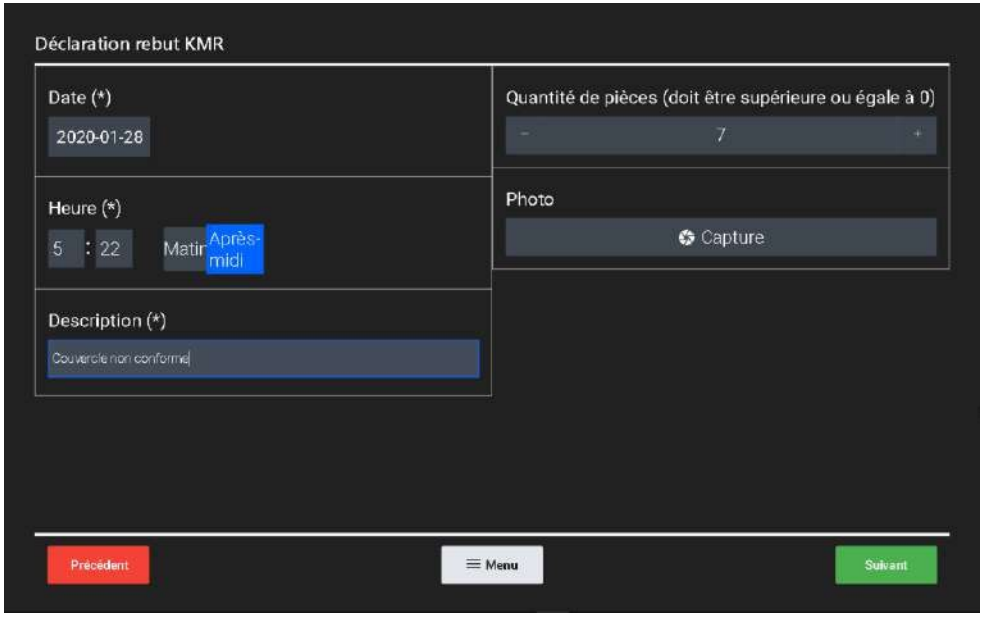
Enter production start-up details for KMR machine



Declaration of machine stoppage

Declaration of non-conforming or scrapped parts


Qualifier un arrêt KMR
Date
2020-01-28
Arrêt non connu
Ecrire ici
Heure (Respectez la forme 00.00) (*)
14.50
Photo
Clear
Retake
Type d'arrêt (*)
Arrêt d'urgence
Information complémentaire sur l'arrêt (*)
Un arrêt d'urgence dû à une collision du robot
Précédent
Menu
Suivant


Déclaration rebut KMR
Date (*)
2020-01-28
Quantité de pièces (doit être supérieure ou égale à 0)
7
Heure (*)
5 : 22
Matin
Après-midi
Photo
Capture
Description (*)
Couvercle non conforme
Précédent
Menu
Suivant

Example 3: CFAI de l'Eure| Data acquisition on the ERMAFLEX line

GENERAL

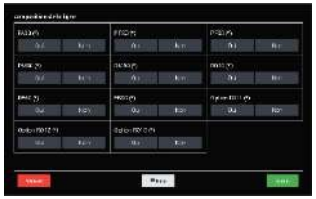
- First network private of technical and industrial training
- Success rate: 83
- 300,000 investment in machinery, robots...
- 33 Bac pro, BTS, DUT, licence and engineer diplomas

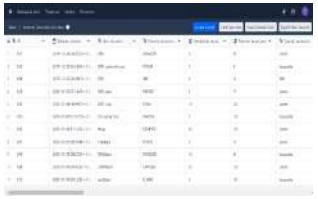
CHALLENGE

- A production line made up of several machines with paper production orders
- Production information is not exploited
- No visibility on production indicators

SOLUTION

- Development an application for creating and saving production orders in Tulip tables.
- Operators are guided step-by-step through machine set-up using digital work instructions
- Acquisition of production data from machine PLCs using Kepware software
- Real-time display of production indicators (TRS, TRG, MTBF, etc.) using PLC data.





APPS

VISUAL WORK INSTRUCTIONS

TRAINING

MACHINE MONITORING

CONNECTED TOOLS

COMPUTERS

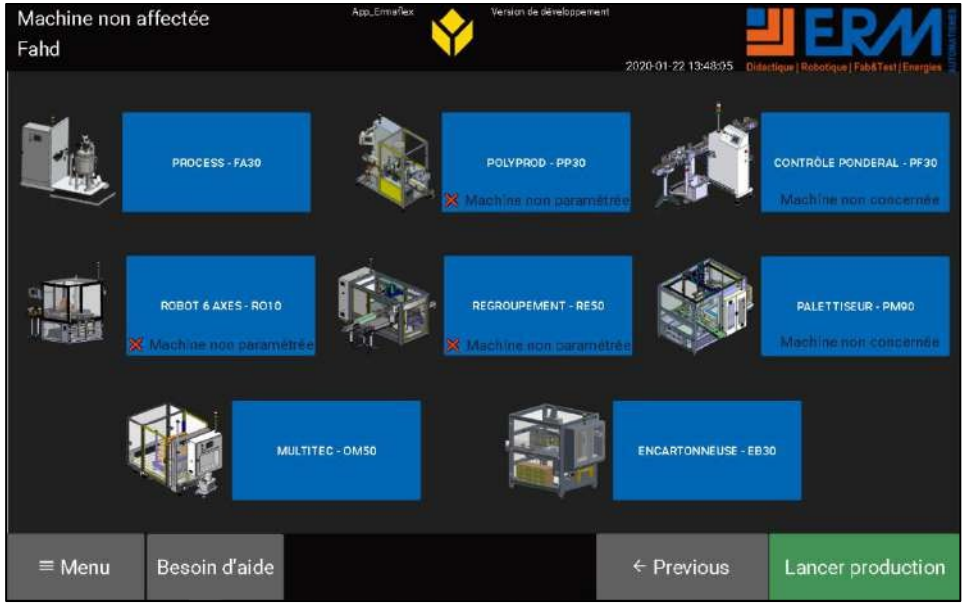
TABLETS

SOFTWARE CONNECTED TO

SERVER
OPC - KEPWARE

Example 3: CFAI de l'Eure| Digital work instructions

Step Choice of machine to configure



Step Start configuration product format

Step Configuration of production parameters

Step Product format changeover settings


Machine non affectée
Fahd
App_Ermaflex
Version de développement
2020-01-28 16:54:16
POLYPROD
Paramétrage
1
Sortir
Recette :
0000
Contenant :
Pots
1
Produit :
Pots
Flacons
2
Fonctionnement
Auto. / P. à P.
Liquide
Volume dose :
10
ml
Réglage à faire sur la pompe :
000
%
Réglage offset:
+00
Granulé
Tours de vis :
1
tours
1. Ensuite, appuyez sur la petite flèche du champ "contenant".
2. Choisissez : pot
Ordre de fabrication
N° OF : 001
Nom du client : ERM
Nombre de contenants : 4
Nombre de cartons : 8
Type de contenants : carton
Type de produit : pot
≡ Menu
Besoin d'aide
← Précédent
Sortir


Machine non affectée
Fahd
App_Ermaflex
Version de développement
2020-01-28 16:52:01
1
2
Positionnez les vérins 1A1 et 2A2 au poste de dosage souhaité : poste de dosage produits solides '1' ou poste de dosage produits liquides '2'
Ordre de fabrication
N° OF : 001
Nom du client : ERM
Nombre de contenants : 4
Nombre de cartons : 8
Type de contenants : carton
Type de produit : pot
≡ Menu
Besoin d'aide
← Précédent
Suivant →
Sortir

Example 4: CFAI d'Istres| Monitoring and data acquisition on the ERMAFLEX line

GENERAL

- First network private of training network
  technical and industrial
- Success rate: 86
- 23 Bac pro, BTS, DUT, licence and engineer diplomas

CHALLENGE

- A production line in a workshop with more than 5 machines
- The person in charge must be on hand to see what's happening on the line.
- Production information is simply displayed on the consoles of the machines in question.

APPS

VISUAL WORK INSTRUCTIONS

TRAINING

MACHINE MONITORING

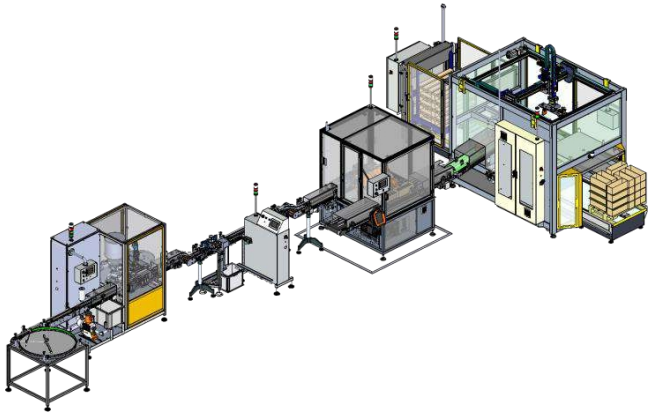
CONNECTED TOOLS

COMPUTERS

TABLETS

SOLUTION

- Connection of individual machines to each other, to Tulip and to ERP using Kepware communication software
- Real-time acquisition of production data from ERP (OF) and machine PLCs
- Development of a real-time machine monitoring application for all machines on the production line, enabling remote control of the line.
- Real-time calculation of production indicators, by machine and sector, and display on Tulip dashboards



SOFTWARE CONNECTED TO

SERVER
OPC - KEPWARE

ERP-ODOO

Example 4: CFAI Istres| Data acquisition screens for the ERMAFLEX line

Main machine monitoring screen

SERVEUR OPC kepware®

Production parameters screen for the selected machine

List of machines